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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/997,696      | 11/30/2001  | Anthony Charles Bach | 18872.0004          | 4744             |

7590 06/29/2004  
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EXAMINER

LEURIG, SHARLENE L

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2879

DATE MAILED: 06/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                        |  |                     |  |
|------------------------------|------------------------|--|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> |  | <b>Applicant(s)</b> |  |
|                              | 09/997,696             |  | BACH ET AL.         |  |
|                              | <b>Examiner</b>        |  | <b>Art Unit</b>     |  |
|                              | Sharlene Leurig        |  | 2879                |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 April 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 17-22 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12, 14 and 23-25 is/are allowed.
- 6) ☒ Claim(s) 1-4, 13, 15 and 16 is/are rejected.
- 7) ☒ Claim(s) 5-11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>112403</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. The amendment filed April 12, 2004 has been entered and acknowledged by the examiner. Claims 9, 12 and 14 have been amended and claims 23-25 have been added.

### ***Priority***

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4, 13 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Kojola (4,687,921).

Kojola discloses a photomultiplier comprising a plurality of dynodes (each curved element of dynode structure 13) arranged in cascade so that the second and any subsequent dynodes each receive electrons from the preceding dynode, the dynodes being of curvilinear cross-section and arcuate in extent about a common axis. The common axis about which the dynodes are arcuate is the axis coming out of the page in

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Figure 1, since the individual dynodes can be seen to be segments of separate and concentric circles. The successive dynodes are disposed so that the cascade, which extends from the photocathode (14) across the dynodes (13) to the anode (12), extends radially relative to the axis.

Regarding claim 2, the successive dynodes are disposed successively outward of each other radially relative to the axis defined above.

Regarding claim 3, the curvilinear cross-section includes an arcuate portion (the arching element of each dynode) and a straight portion extending tangentially therefrom (each of the hash marks extending from the curved portion of each dynode in Figure 1).

Regarding claim 4, each of the dynodes is part annular.

Regarding claim 13, the photomultiplier includes a part annular anode (12) for receiving electrodes from the last dynode.

Regarding claim 15, the anode and its support structure are thin, where thin is interpreted as being less than the width of the photomultiplier tube. The claim limitation of reducing anode capacitance is intended use and therefore is not given patentable weight.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kojola (4,687,921) in view of Beetz, Jr. et al. (6,384,519) (of record).

Kojola discloses a photomultiplier comprising a plurality of dynodes, but lacks explicit disclosure of the material forming the dynodes.

Beetz, Jr. teaches a compact photomultiplier achieved by dynodes (Figure 2, elements 36a-d) that are formed of layers of a secondary emissive material (52) deposited on shaped surfaces of a common substrate of insulating material (column 10, lines 15-17). The individual dynodes are formed in a common layer (36), the amplification properties being achieved by deposition of an emissive layer on each dynode.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kojola's dynodes to be formed of emissive material deposited on shaped insulating material of a common substrate in order to provide a compact photomultiplier with good signal amplification, as taught by Beetz, Jr.

#### ***Allowable Subject Matter***

7. Claims 12, 14 and 23-25 are allowed.

8. The following is an examiner's statement of reasons for allowance:

Claims 23-25 are newly added independent claims containing the previously indicated allowable subject matter of claims 5, 9 and 11, respectively, and each and every limitation of the base claims of claims 5, 9 and 11, respectively. Therefore these

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new independent claims are allowable. Claims 12 and 14 have been amended to depend from allowable claim 24, and therefore are also allowable.

9. Claims 5-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claims 5, 9 and 11, the reasons for allowable subject matter were given in the previous office action.

Regarding claims 6-8, the prior art of record does not teach or suggest the photomultiplier of claim 1 having dynodes with varying effective areas.

Regarding claim 10, the prior art of record does not teach or suggest the photomultiplier of claim 1 having the limitation of alternate dynodes being spaced from each other successively *along* the common axis *around* which the dynodes are arcuate.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Response to Arguments***

10. Applicant's arguments, see Remarks, filed April 12, 2004, with respect to the rejection(s) of claim(s) 1 and its rejected dependents under 35 U.S.C. 102(b) as being anticipated by Ito et al. (JP 63-078448A) and Okano et al. (5,633,562) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn.

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However, upon further consideration, a new ground(s) of rejection is made in view of Kojola (4,687,921).


### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharlene Leurig whose telephone number is (571) 272-2455. The examiner can normally be reached on Monday through Friday, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

sll



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